Common Core Standards

Grade 4

4.OA.A.3

Solve multistep word problems using the four operations; represent with equations; assess reasonableness.
The grocery coupons, hose-filling, and other real-world stories require two- and three-step solutions and ask students to check that their final answers make sense.

4.OA.A.2

Multiply or divide to solve word problems involving multiplicative comparison.
Scenarios such as doubling fruit weight or scaling cookie batches have students compare quantities multiplicatively, not additively.

4.NBT.B.5

Multiply a whole number of up to four digits by a one-digit whole number.
Many quick-fire drills include products like 25×3, reinforcing single-digit-by-multidigit multiplication fluency.

4.NBT.B.6

Find whole-number quotients with up to four-digit dividends and one-digit divisors.
Expressions such as 60÷6 or 100÷(5×2) give repeated practice with single-digit divisors in larger calculations.

4.MD.A.2

Use the four operations to solve word problems involving distances, intervals, liquid volume, money, etc.
Power-bill, road-trip rental, and pool-filling problems integrate real units and demand correct operation choice and order.

Grade 5

5.OA.A.1

Use parentheses, brackets, or braces in numerical expressions and evaluate them.
Every PEMDAS drill relies on correctly interpreting nested grouping symbols.

5.OA.A.2

Write and interpret simple numerical expressions.
Students translate word problems into expressions and explain, for example, why $7+3\times4-2=17$.

5.NBT.B.5

Fluently multiply multidigit whole numbers.
Multi-step expressions embed products like 12×5 that strengthen long-multiplication skills.

5.NBT.B.6
Find whole-number quotients of multidigit dividends.
Problems such as $600\div(2\times5)$ provide systematic division practice within more complex expressions.

5.NBT.B.7
Add, subtract, multiply, and divide decimals to hundredths.
Money contexts ($1.50 cookies, $0.30 per mile, sales tax and tip) require precise decimal arithmetic.

5.NF.B.3
Interpret a fraction as division of the numerator by the denominator.
Distributive-via-reciprocals drills split single fraction bars into separate quotients, reinforcing the "fraction as division" concept.

Grade 6

6.EE.A.1

Write and evaluate numerical expressions involving whole-number exponents.
Nearly every drill uses exponents such as
3^3 or 4^2, giving systematic practice with powers.

6.EE.A.2

Write, read, and evaluate expressions with variables using order of operations.
The numeric PEMDAS routines here mirror exactly what students will do when variables replace numbers in grade 6.

6.EE.A.3

Apply the properties of operations to generate equivalent expressions.
Dedicated sets on commutative, associative, distributive, identity, inverse, zero, and closure properties show students how to manipulate expressions safely.

6.EE.A.4

Identify when two expressions are equivalent.
Students prove, for example, that $8 \div \frac{1}{4} = 8 \times 4$ or that (2×5)×3=2×(5×3).

6.NS.A.1

Interpret and compute quotients of fractions; solve word problems involving division of fractions.
Reciprocal-inversion drills such as $18 \div \frac{3}{2}$ target fraction division directly.

6.NS.B.2

Fluently divide multi-digit numbers using the standard algorithm.
Expressions with quotients like 6000÷(2×5) demand solid long-division skills inside larger computations.

6.NS.B.3

Fluently add, subtract, multiply, and divide multi-digit decimals.
Problems that chain decimal operations—calculating electricity costs or restaurant bills with tax and tip—match this fluency standard.

Answers

Quick Fire Drills Set 1

1. $8 + 6 \times 2 \rightarrow 20$
2. $(9 - 4)^2 \div 5 \rightarrow 5$
3. $18 \div 3 \times (2 + 7) \rightarrow 54$
4. $7 + 3 \times 4 - 2 \rightarrow 17$
5. $(6 + 2) \times 5 - 3^3 \rightarrow 13$
6. $48 \div (2 \times 4) + 6 \rightarrow 12$
7. $5 \times [4 + (6 - 3)^2] \rightarrow 65$
8. $(15 - 3) \div 3 + 2^2 \times 5 \rightarrow 24$
9. $10 - 2 \times (8 \div 2^3) \rightarrow 8$
10. $(9 + 1) \times (7 - 4) \div 2 + 5 \rightarrow 20$

Quick Fire Drill Set 2

1. $5 \times (3 + 4)^2 \div 7 \rightarrow 35$
2. $12 - 6 \div 3 + 2^2 \rightarrow 14$
3. $(8 + 2) \times 3 - 4^3 \div 2 \rightarrow -2$
4. $9 + 18 \div (3 \times 2) - 5 \rightarrow 7$
5. $7^2 - (3 + 5) \times 4 \rightarrow 17$
6. $50 \div 5 \times (6 - 2) + 1 \rightarrow 41$
7. $(14 - 6)^2 \div 4 - 9 \rightarrow 7$
8. $3 \times 2^2 - (10 \div 2) + 6 \rightarrow 49$
9. $(27 \div 3) \times (4 + 1) - 2^2 \rightarrow 41$
10. $100 \div (5 \times 2) + 3^3 - 7 \rightarrow 30$

Quick Fire Drills Set 3

1. $(18 \div 3)^2 - 4 \times 5 \rightarrow 49$
2. $7 + 5 \times (12 - 8) \div 2 \rightarrow 17$
3. $60 \div (4 + 2) + 3^3 \rightarrow 53$
4. $9 \times 2^2 - (16 \div 4) + 1 \rightarrow 29$
5. $(25 - 10) \div 5 + 6 \times 7 \rightarrow 44$
6. $12 + 3 \times [8 - (6 \div 3)] \rightarrow 27$
7. $5^2 - (9 - 4) \times 3 \rightarrow 10$
8. $(42 \div 6) \times (3 + 2) - 7 \rightarrow 28$
9. $100 \div (2 \times 5) + 4^3 \rightarrow 76$
10. $8 \times (6 - 2)^2 \div 4 - 11 \rightarrow 45$

Quick Fire Drill Set 4

1. $(4 + 2) \times 3^2 \div 6 \rightarrow 9$
2. $18 - 3^2 \times 2 + 4 \rightarrow 4$
3. $8 \times (5 - 2) + 12 \div 3 \rightarrow 28$
4. $(10 + 5) \div (2 + 3) + 6 \rightarrow 9$
5. $6^3 \div (9 \times 2) - 7 \rightarrow 5$
6. $45 \div (3 \times 3) + 2^2 \times 4 \rightarrow 21$
7. $(20 - 8) \times 2 + 30 \div 5 \rightarrow 30$
8. $14 + 6 \times (9 - 7)^2 - 8 \rightarrow 30$
9. $(36 \div 4)^2 - 5 \times 4 \rightarrow 61$
10. $3 \times 7 + 4^2 - 6 \div 2 \rightarrow 34$

Quick Fire Drills Set 5

1. $6 + 4 \times (9 - 2) \div 7 \rightarrow 10$
2. $(3^3 - 5) \times 2 + 8 \rightarrow 52$
3. $50 \div (2 \times 5) + 6^2 - 13 \rightarrow 28$
4. $7 \times (14 - 8) - 3^2 \rightarrow 33$
5. $100 - 4 \times (6 + 2)^2 \div 8 \rightarrow 68$
6. $(18 \div 3 + 5) \times 4 - 12 \rightarrow 32$
7. $9^2 \div (3 \times 3) + 7 - 5 \rightarrow 11$
8. $60 \div 5 - (2 + 4) \times 3 \rightarrow -6$
9. $(5 + 7)^2 \div 3 - 16 \rightarrow 32$
10. $8 \times 2^3 - (9 - 3) \div 2 \rightarrow 61$

Word Problems

Card 1 Set 2
Grocery coupon mix-up
Story in symbols

Double the 3 lb of oranges:
3×2=6 lb

Price of fruit:
6×$2=$12

Apply the $4 coupon:
$12−$4=$8

Why PEMDAS?
Multiplication (weight × price) must come before subtraction (coupon) or the discount would be taken off the wrong figure.

Card 2 Set 2
Patio project
Story in symbols

Side length:

3+5=8 m (parentheses first)

Area of the square patio:
$8^2=64\ m^2$ (exponent next)

Stone cost:
64×$12=$768

Rebate:
$768−$40=$728

Why PEMDAS?
If squaring had been done before adding, or the rebate subtracted too early, the cost would be wrong.

Card 3 Set 2
Road-trip rental
Story in symbols

Mileage charge:
120 mi×$0.30=$36

Day's total:
$50+$36=$86

Each friend pays:
$86÷4=$21.50

Why PEMDAS?
Mileage (a multiplication) is computed before it is added to the fixed daily fee, then the grand total is divided equally.

Card 4 Set 2
Classroom layout
Story in symbols

Desks per row:
$4+3=7$

Build six rows:
$7\times6=42$

Remove five:
$42-5=37$

Why PEMDAS?
Grouping the 4 + 3 first is essential; if you multiplied before adding you would create only 4 desks per row.

Card 5 Set 2
Bake-sale math
Story in symbols

Cookies sold:
$8\text{ doz}\times12=96$

Revenue:
$96\times\$1.50=\$144$

Ingredient cost:
$0.40\times\$144=\$57.60$

Profit to donate:
$\$144-\$57.60=\$86.40$

Why PEMDAS?
Percentages are multiplications that must precede subtraction, otherwise one would subtract before the expense is even found.

Card 6 Set 2
Power-bill check-up
Story in symbols

Convert power:
$60\text{ W}=0.06\text{ kW}$

Monthly hours:
$5\times30=150\text{ h}$

Energy used:
$0.06\times150=9\text{ kWh}$

Cost:
$9\times\$0.15=\$1.35$

Why PEMDAS?
Each line is a multiplication; chaining them in the right sequence (kW × h before multiplying by price) keeps units consistent.

Card 7 Set 2
Filling the backyard pool
Story in symbols

First 3 h with both hoses:
$(600+400)\times3=1000\times3=3000\text{ L}$

Next 2 h with Hose A only:
$600\times2=1200\text{ L}$

Water now:
$500+3000+1200=4700\text{ L}$

Why PEMDAS?
The bracketed addition combines the two flow rates before multiplying by time, then all volumes are added to the initial 500 L.

Card 8 Set 2
Dinner with tax & tip
Story in symbols

Entrées:
3×\$18=\$54

Sub-total:
\$54+\$9=\$63

Tax:
0.08×\$63=\$5.04

Post-tax total:
\$63+\$5.04=\$68.04

Tip:
0.20×\$68.04=\$13.61 (rounded)

Grand total:
\$68.04+\$13.61=\$81.65

Share per diner:
\$81.65÷3≈\$27.22

Why PEMDAS?
Percent calculations (multiplication) precede their associated additions, and the tip percentage must be taken on the taxed amount, not the untaxed subtotal.

Card 9 Set 2
Six-month savings plan

Assumption used – the 2 % interest is compounded monthly only on the opening \$2 000, while each \$150 deposit earns no interest during the six-month window.

Story in symbols

Opening balance growth:
$\$2000\times(1.02)^6 = \$2252.32$

Total deposits:
6×\$150=\$900

Final balance:
\$2252.32+\$900=\$3152.32

Why PEMDAS?
The exponent handles compounding before any addition. Deposits are then added, keeping the timeline clear.

Card 10 Set 2
Carbon-footprint swap
Story in symbols

Beef meals per 4 weeks:
4 meals/week×4=16

CO_2 saved per meal:

5 kg×0.60=3 kg

Total CO_2 avoided:
16×3=48 kg

Why PEMDAS?
The percentage reduction (multiplication) is applied before scaling up to the month-long total.

The quick-fire drills that follow make use of the previous skills used in PEMDAS along with the multiplication property being studied.

Card MP1

$3\ (5 + 2) - 4^2 \rightarrow 5$

$2\ (7 - 3) + 5 \times (6 - 2) \rightarrow 28$

$6\ (4 + 3^2) \div 3 \rightarrow 26$

$(5 + 1)(8 - 2) - 10 \rightarrow 26$

$7^3 - 2\ (9 - 4)^2 \rightarrow 293$

$4\ (12 \div 3 + 5) - 6 \rightarrow 30$

Card MP2

$(-8 \times -3) + 5^2 = 29$

$\frac{3}{4} \times \frac{8}{3} - 1 = 1$

$\sqrt{5} \times \sqrt{20} \div 2 = 5$

$2\pi \times 1 - \frac{3}{2}\pi = \frac{1}{2}\pi$

$(-7 \times 6) \div (-3) = 14$

$(5 \times 0.6)^2 - 2 = 7$

Card MP3

$8 \times \frac{1}{8} + 3^2 = 10$

$\frac{5}{9} \times \frac{9}{5} - 4 = -3$

$\left(-7 \times -\frac{1}{7}\right)^b + 2 = 3$

$6^2 \div \left(3 \times \frac{1}{3}\right) = 36$

$\pi \times \frac{1}{\pi} \div 2 \times 5 = 11$

$\left(\frac{\sqrt{3}}{2} \times \frac{2}{\sqrt{3}}\right)^3 - 5 = -4$

Card MP4

$5 \times 0 + 7^2 = 49$

$3^3 - (0 \times 12) \div 4 = 27$

$(8 + 2) \times 0 + 15 = 15$

$12 + (7 \times 0) - 5^2 = -13$

$(14 \div 2) \times 0 + 3^2 = 9$

$\left(\sqrt{16} \times 0\right)^2 + 1 = 1$

Card MP5

$1 \times 9 + 4^2 = 25$

$\left(8^2 \div 4\right) \times 1 + 3 = 19$

$(6 + 1) \times 1 + 7 = 14$

$5^3 - (1 \times 10) \div 2 = 120$

$1 \times \pi + 2^2 \times 3 = \pi + 12$

$(20 \div 4)(1 + 2) \times 1 - 5 = 10$

Card MP6

$\left(2 \times 5\right) \times 3 - 4^2 = 14$

$6 + (4 \times 2) \times 5 = 46$

$(3 \times 4) \times 2^2 \div 8 = 6$

$7^2 - 2 \times (5 \times 3) = 19$

$((1 + 1) \times 3) \times 5 - 7 = 23$

$2 \times (3 \times (4 \times 5)) \div 10 = 12$

Card MP7

$7 \times 4 + 3^2 = 37$

$(5 + 1) \times 9 \times 2 - 8 = 100$

$4 \times (-3) \div 2 + 10 = 4$

$2^3 + 8 \times 0.5 - 6 = 6$

$(9 - 4)^2 - 1 \times \pi = 25 - \pi$

$8 \times \frac{3}{4} + \left(2^3 - 3\right) = 7$

Card DP1

$(14 - 6) \div 1 + 3^2 = 17$

$4 \times (9 \div 1) - 2^3 = 28$

$(18 \div 1) \div 3 + 7 = 13$

$5^2 + (12 \div 1) \times 2 = 49$

$(10 + 5) \div 1 - (4 \times 2) = 7$

$2 \times [(8 \div 1) + 3] - 4 = 18$

Card DP2

$(0 \div 6) + 8^2 = 64$

$5 \times (0 \div 4) + 3 = 3$

$(12 - 12) \div 3 + 7 = 7$

$9^2 - (0 \div 2) - 81 = 0$

$(0 \div 9) \times 5 + 2^2 = 4$

$[(6 \times 0) \div 3] + (10 - 10) = 0$

Card DP3

$14 \div (7 - 7) + 3 =$ undefined

$5 \times [4 \div (2 - 2)] - 1 =$ undefined

$(3^2 - 9) \div 0 + 8 =$ undefined

$16 \div (4 \times 0) + 2 =$ undefined

$(12 + 6) \div (18 - 18) - 5 =$ undefined

$25 \div (5 - 5) + 4^2 =$ undefined

Card DP4

$8 \div (1/4) - 3^2 = 23$

$6 \times (3/2 \div 1/3) + 4 = 31$

$9 \div (3/4) - 5 = 7$

$(15 \div 5) \div (1/3) - 4 = 5$

$4 \times [10 \div (2/5)] - 6 = 94$

$18 \div (3/2) + 1 = 13$

Card DP5

$(12 + 24) \div 6 + 2^2 = 10$

$(5^2 + 15) \div 5 - 3 = 5$

$7 + (18 - 6) \div 3 = 11$

$(16 + 8) \div (2^2) + 1 = 7$

$(30 + 15 - 9) \div 3 + 2^2 = 16$

$(4 \times 5 + 2^3) \div 2 - 6 = 8$